



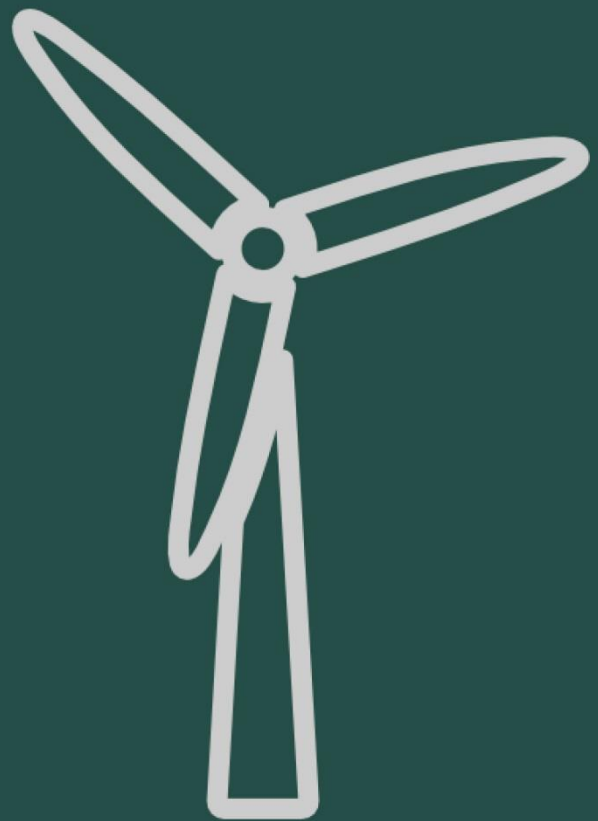
**ROYAL DANISH
CONSULATE GENERAL**
The Trade Council in Istanbul

APRIL 2020

WIND ENERGY MARKET IN TURKEY

POTENTIAL FOR DANISH STAKEHOLDERS

Prepared by The Trade Council of Denmark in Istanbul





WIND ENERGY IN DENMARK

SUMMARY

- ✚ Denmark is one of the world's leading producers of windpower; in 2015 the percentage of windpower in the country's electricity mix was the highest in the world. As part of the government's 2050 energy strategy, wind, along with biomass and biogas, are expected to account for 40% of the country's electricity needs.
- ✚ Wind-electricity generation capacity more than doubled between 2008 and 2018, with installed capacity in 2018 amounting to 6,345 MW. It is forecast to keep increasing rapidly over the forecast period, expanding at an average of 4.6% between 2018 and 2023, with installed capacity in 2023 forecast to reach 7,745 MW.
- ✚ In November 2016 Vattenfall won the tender to develop what will become the world's second-largest offshore wind farm. The 600-MW Danish Kriegers Flak project will be built in the Baltic Sea, with the total cost of the project estimated at EUR1.1bn-1.3bn (US\$1.29bn-1.52bn). Construction began in 2019 and it should be in full production by the end of 2021.
- ✚ Denmark also set itself the target to reduce greenhouse-gas emissions by 40% from the 1990 level by 2020. Based on our current projections, Denmark should come very close to achieving this goal, with carbon dioxide (CO₂) emissions forecasted to drop to 54.3% of 1990 levels by 2020.

WIND ENERGY MARKET IN TURKEY

- 62% of Turkey's electricity generation was supplied from the domestic and renewable sources, and renewable installed capacity reached 44,776 MW, comprising 49 percent of the total installed capacity, as of the end of 2019.
- 8 % of the electricity generation supplied from wind energy in 2019.
- In terms of renewable energy installed capacity, Turkey ranks 7th in Europe and 13th in the world.

Turkey offers ideal natural conditions for wind power installations with an estimated total 48 GW wind potential and an average wind speed of more than 7m/s at 50m. There are large suitable and untapped areas for wind power plants (WPP) especially in the Aegean and Mediterranean regions.



Wind Sector To Remain Biggest Despite Solar Surge
Turkey - Renewables Capacity By Type, 2015-2028 (MW)

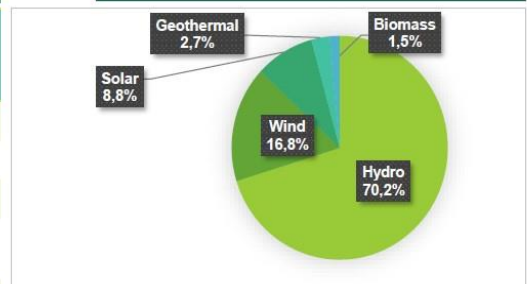


Source: Turkish Wind Energy Association; December 2019 Report

INSTALLED CAPACITY OF RENEWABLES (END-2017)

Source	Installed Capacity (MW)	Number of Plants	Ratio to Total Renewable Capacity (%)
Hydraulic	27,273	618	33,9
Wind	6,516	161	7,3
Solar	3,421	3,619	1
Geothermal	1,064	40	1
Biomass	575	98	0,6

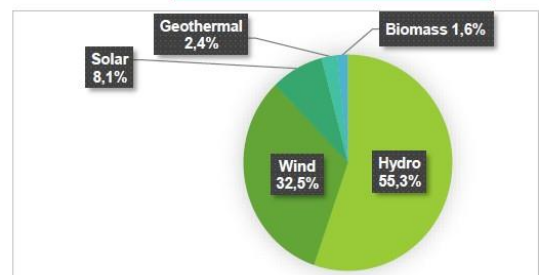
RENEWABLE INSTALLED CAPACITY 2017



TARGETS FOR RENEWABLE INSTALLED CAPACITY (MW)

Source	2019	2023
Hydraulic	32,000	34,000
Wind	10,000	20,000
Solar	3,000	10,000
Geothermal	700	1,500
Biomass	700	1,000

INSTALLED CAPACITY 2023

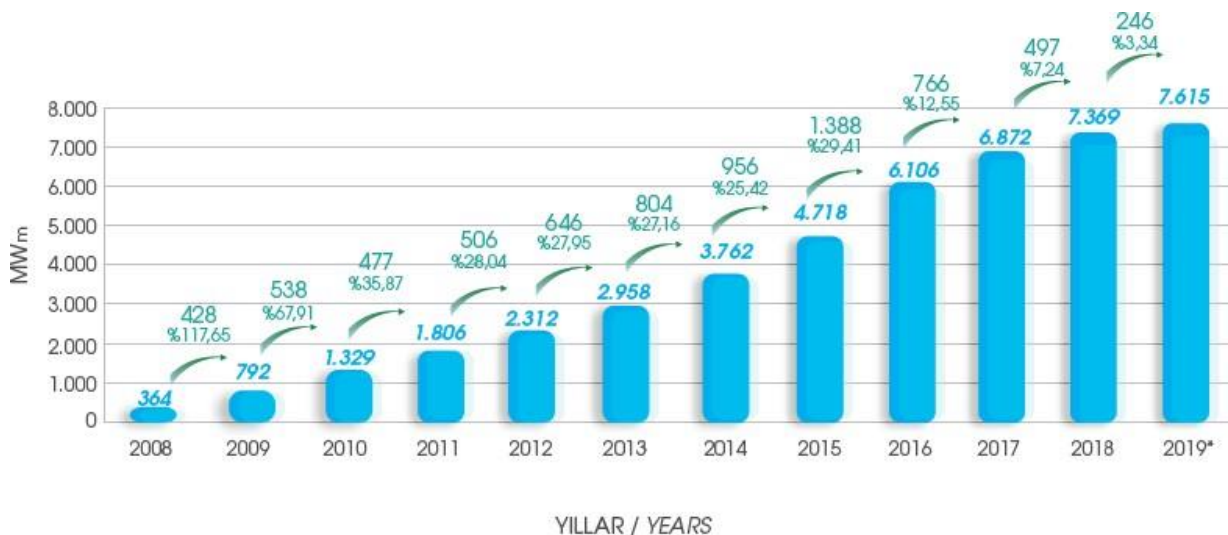




Wind energy is the most dynamic and lucrative market for local and international investors with more than 7500 MW in notable capacity additions every year.

Turkey's wind energy sector attracted \$12.3 billion in investments over the past 11 years, data from the Turkish Wind Energy Association (TUREB) showed on December 21, 2017.

The supportive instruments of the government for renewables, including feed-in-tariff and local content support, have provided the required foundation for the stable growth of wind energy power plants. In Turkey, **as end of January 2019, 180 wind energy companies are actively operational with 7,615 MW of installed capacity, and 18 projects with 606 MW of installed capacity are under construction.**¹



➤ INCENTIVES

Turkey has the 10 GW wind power installed capacity target as of 2020.

F-I-T SYSTEM

Feed-in-tariff as a power purchase guarantee is granted to licensed and unlicensed renewable energy investors in line with the Turkish Government's support policy for renewable energy resources. A purchase guarantee of \$7.3 cents/kWh (more than the average spot market price) is granted for wind electricity for the first 10 years of operation. In addition, further local content incentives are available for wind power plants operating under a generation license for the first 5 years of operation.



Feed-in-tariff and Local Equipment Bonus for Wind Power	
Locally manufactured component	Bonus (USD cent/kWh)
Blade	0.8
Generator and power electronics	1
Turbine tower	0.6
All mechanical equipment in rotor and nacelle (excluding blade group, generator, and power electronics)	1.3
Total	7.3 + 3.7 = 11

The FIT system will end at the end of 2020 and will include the investments that will end till 2021. The new incentive scheme is to be announced soon.

OTHER SUPPORTING SCHEMES

Support Measures	General Investment Incentive Scheme	Regional Investment Incentive Scheme	Large Scale Investment Incentive Scheme	Strategic Investment Incentive Scheme
VAT Exemption	✓	✓	✓	✓
Customs Duty Exemption	✓	✓	✓	✓
Tax Reduction		✓	✓	✓
Social Security Premium Support (Employer's Share)		✓	✓	✓
Income Tax Withholding Support *	✓	✓	✓	✓
Social Security Premium Support (Employee's Share) *		✓	✓	✓
Interest Support **		✓		✓
Land Allocation		✓	✓	✓
VAT Refund				✓

➤ RENEWABLE ENERGY ZONE (RE-ZONE / YEKA)

New Investment Model for Renewables, YEKA (Renewable Energy Designated Areas) to boost the wind energy market in Turkey aims:

- to use renewable energy resources much more efficiently and effectively by identifying renewable energy zones on public, treasury, or private-owned territories;
- to realize the renewable energy investments much more rapidly;
- to manufacture renewable energy equipment in Turkey;
- to use locally-manufactured equipment/components; and
- to contribute to research and development activities through technology transfer.



➤ THE FIRST YEKA TENDER (2017)

The first YEKA tender for 1-GW wind power plants with local manufacturing and research and development (R&D) requirements, which is the largest-ever wind power auction in Turkey's history, took place in August 2017.

A Siemens Gamesa Renewable Energy-led consortium, which includes Turkerler and Kalyon Enerji holdings, has won a \$1-billion wind energy tender, offering the lowest price to the state with \$3.48 cents per kWh.

The consortium has also signed an energy purchase agreement for 15 years starting from the date of signature. An overall 1 GW needs to be ready in the subsequent 36 months after the licence.

The factory is constructed in İzmir Ali-ağa in November 2019 and the production is expected to start in 2020.



➤ CONDITIONS ON LOCAL CONTENT

- The consortium must build a wind turbine factory in Turkey with the capacity of at least **150 units of 2.3 MW per year up to 21 months** after the contract was signed.
- There are a **65% domestic content** requirement and rules for the hiring of local workforce.
- At least **80% of expenses for R&D within the country** must be covered by the consortium.
- A budget of **\$5-million has been designated for R&D** over one decade, with 50 full-time employees.
- The plant must be set up **within 21 months** following the agreement.
- It is possible (and encouraged) to cooperate with the country's so-called techno-cities and technology centres for start-up innovations.

➤ YEKA TENDER PLANS FOR 2020

ONSHORE WIND YEKA 2

- The Ministry of Energy and Natural Resources has announced a new YEKA tender in 2019.
- The tender consists of 4 auctions; each of them has 250 MW capacity (1000 MW total). **EnerjiSa** Production and **Enercon** made the best offers in competitions for the establishment of a total 250 MW of wind power plants.
- The regions for this YEKA are: Balıkesir, Çanakkale, Aydın and Muğla.
- Local content condition will be 55% for the turbines.



➤ G2G RELATION BTW TURKEY & DENMARK ON OFFSHORE WIND (2020-2022)

- 1200 MW capacity YEKA tender on 23rd of October 2018 has been postponed due to immature tender conditions.

Offshore wind market in Turkey has the potential to play a substantial part of meeting energy demand in Turkey as initial assessments show great offshore wind potential along the Turkish coast. However, successful offshore wind development requires long term planning and investment by stakeholders.

Within this framework, **Danish Energy Agency** and **Turkish Ministry of Energy and Natural Resources** have signed a bilateral agreement in March 2019 to develop "Roadmap for Offshore Wind in Turkey.

The second phase covering 2020-2022 have been approved that will focus on sharing Denmark's experience in this sector, detailing the preparation of tenders and infrastructure and other related topics.

The aim for the project stems from Turkey's recent focus on offshore wind energy and Denmark having over 25 years of history in offshore wind development.



➤ INTERNATIONAL FAIRS

Trade Council of Denmark Turkey plans to organize a wind delegation to Turkey in January 2021 in close cooperation with Danish Wind Export Association.

TÜREK 2020 TWEC

9. TÜRKİYE RÜZGAR ENERJİSİ KONGRESİ
TURKISH WIND ENERGY CONGRESS

05-07 KASIM 2020
NOVEMBER

SHERATON HOTEL CESME, İZMİR

İŞBİRLİKLERİ İLE

TÜREK TWEA
TÜRKİYE RÜZGAR ENERJİSİ BİRLİĞİ
TURKISH WIND ENERGY ASSOCIATION

İZMİR KALKINMA AJANSI

İNVEST IN İZMİR

KAMU ve ULUSLARARASI PAYDAŞLAR

T.C. ENERJİ VE TABİİ KAYNAKLAR BAKANLIĞI

T.C. SANAYİ VE TEKNOLOJİ BAKANLIĞI

EPX ENERJİ PİYASASI DÜZENLEME KURUMU

Wind EUROPE

GWEC GLOBAL WIND ENERGY COUNCIL

www.turek.org.tr



➤ **OPPORTUNITIES FOR DANISH COMPANIES**

UNIQUE LOCATION

As the intersection point of Europe, Central Asia and Middle East, Turkey is a gate to these regions. More energy transformation projects will be adopted in the Middle East and North Africa Region. Thanks to geographical and cultural proximity, Turkey can be used as a hub to those growing markets.

SKILLED LABOR FORCE

COMPONENT SOURCING

Turkey is advanced in producing components of wind energy industry; with the new YEKA investment model, which promotes local industry, Turkey will increase its capacity even more in the near future. For emerging markets around Turkey, energy components can be produced in Turkey.

- 50% of the components can be domestically produced.
- 70% of blade and tower production was exported; 30% was used in domestic market (2017)
- A Great number of government incentives.
- Partnership and production opportunities with Turkish Companies.
- Strategic Sector cooperation Project and government-to-government cooperation between Turkey and Denmark on offshore and onshore wind will create the framework for business development for Danish companies.

PARTNERSHIPS WITH TURKISH COMPANIES

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